

## **REMARKS**

The following remarks are submitted to help address the issues raised in the Office Action mailed Oct. 18, 2005 and in the telephone interview which took place on Dec. 8, 2005.

The applicant has withdrawn nearly all new specification wording that was submitted in her most recent reply to this office, dated June 9, 2005. Exceptions to this are outlined as thoroughly as possible below. To avoid unnecessary repetition and/or confusion, for purposes of these remarks I will refer to the June 2005 specification below as "previous specification"; and the one prior to that as "original specification".

Certain straightforward deletions of bulk material submitted in the previous specification (especially regarding atoms and molecules), or wording that was unclear, are maintained as deleted in the newly submitted specification with this reply.

Corrections of tense and obvious typographical errors submitted in the previous specification are likewise being maintained in this reply. This includes the confusion over the symbols  $\epsilon$  versus  $\epsilon_0$ , as discussed in the phone interview. See further clarification below. The applicant has found two or three additional places where the original specification erroneously used a comma instead of a decimal point, and those places are corrected in the newly-submitted version.

All previous deletions in the previous specification regarding resonant frequencies of atoms and molecules (or short references to such frequencies), are likewise maintained in this reply.

The applicant is including supporting material at the back of these remarks to clarify definitions of the terms (1) "genome", especially in respect to RNA genomes, and (2) "electrical permittivity" and "magnetic permeability". These pages xeroxed or copied from other sources, and are not numbered. Form 1449 (SB08) is included for appropriate reference items.

**(1) Genome.** The first reference is from the 2000 edition of the American Heritage Dictionary, showing its definition of "genome" "the total genetic content of a haploid set of chromosomes in eukaryotes, of a single chromosome in bacteria", and also including the phrase

“or in the DNA or RNA of viruses”. This definition is also available online at any website that is mirroring the American Heritage Dictionary; an example is included from the website [www.yourdictionary.com](http://www.yourdictionary.com).

The GenBank sequence database system has been publicly available online since well before this application was filed, and has included RNA viral genomes in its database. For proof of RNA viral genome submissions, as well as the dates of their submissions which are sometimes pre-1995, please see the virus genome list at [www.ncbi.nlm.nih.gov/genomes/static/vis.html](http://www.ncbi.nlm.nih.gov/genomes/static/vis.html) and click on the accession numbers which will immediately show whether the viral genome is composed of DNA or RNA material. As further supporting material, the first page from a 1999 journal article is included. The last sentence of the abstract states: “the GenBank database and related resources are freely accessible via the URL: <http://www.ncbi.nlm.nih.gov>”. Thus it can be seen that the world’s largest publicly available genome databank included RNA genomes since well before the filing of this application, and distinctly showed them as such.

The text “Fields Virology” contains many references to RNA genomes. The first edition of this text was published in the 1980s, and in 2001 went into its fourth edition.

Thus it is apparent that the term “genome” has commonly included those of the RNA variety for some years, even though not all recent English-language dictionaries have updated their definitions to reflect that in an accurate manner.

Because the applicant did disclose in her original specification an example of an RNA genome (the Rubella virus), the disclosure does therefore include both DNA and RNA pathogenic genomes, as well as messenger RNA genomic material. These genomic materials and the examples originally presented in the specification encompass double-stranded and single-stranded material.

The applicant agrees that use of the term “nucleic acids” in her most recent specification submittal could imply new matter (for instance, nucleic acids can be artificially constructed); and has therefore withdrawn all instances of that change in wording, in the newly-submitted specification with this reply.

The original specification wording does contain an occasional scientific error in wording that should be corrected. For instance, the applicant's counsel wrote at page 20 line 4, "the Rubella measles RNA virus contains 9755 base pairs in its entire genome." This is obviously inaccurate because this RNA virus is single-stranded and does not contain base pairs. As a solution the applicant proposes as close a wording as possible to the original specification that would apply to the single-stranded genomic materials, which would consist of using of the word "bases" - as opposed to "base pairs" for double-stranded material. It is hoped that this will be an acceptable solution to this problem. The only other possible wording the applicant can think of that would be relevant to single-stranded genomic material is "nucleotides" (which was actually used in the original specification at page 17 line 22); but it was felt that "bases" was closer in meaning to the original term "base pairs". Therefore, the word "bases" has been substituted at the appropriate places in the currently submitted specification with this reply. The applicant thanks the examiner for her phone input on this matter, on 1-17-06.

At the location in the original specification where instructions were given to determine the length of genomic material (this is located in the paragraph that begins on page 8 line 22, continuing to page 9 line 6 of the original specification), the applicant therefore proposes adding the word "bases" to the term "base pairs", in order to accurately characterize the non-paired structure of the single-stranded genomic materials discussed at other locations in the original specification (specifically, messenger RNA and single-stranded RNA virus). It is hoped that 1) the original inclusion of examples of single-stranded genomic materials for purposes of this invention, as well as 2) the widespread public knowledge of those familiar with the art, that single-stranded genomic materials are non-paired structures, will be sufficient to allow more accurate wording at the relevant locations, without throwing this particular wording correction into the category of "new matter". This wording adjustment is reflected in the claims, specifically in claim 2.

**(2) Electrical permittivity and magnetic permeability.** As discussed in the phone interview regarding the correction of permittivity and permeability symbols in the original specification, the applicant is including supporting material in order to sustain these corrections. The applicant never intended for permittivity through a medium to be designated as  $\epsilon_0$ , nor

permeability through a medium as  $\mu_0$  (those symbols are only used for those quantities in a vacuum), as evidenced by the following material.

The first item is a copy of the relevant place in the applicant's provisional application, contained on page 4 (the title page and the fourth page are included with this reply for convenience). In the first full paragraph on page four, it states: "a new velocity can be computed from the formula above, using values for permittivity and permeability through biological media. A representative figure for permittivity ( $\epsilon$ ) through body tissue is...and the permeability ( $\mu$ ) through body tissue is...". This would establish that the applicant intended for the symbols  $\epsilon$  and  $\mu$  to be used in conjunction with permittivity and permeability through tissue.

Further to this intention, on page 14 of the applicant's original specification beginning with line 2, it states: "The velocity of electromagnetic radiation through a general in-vivo tissue medium is equal to the inverse of the square root of the product of the electrical permittivity and the magnetic permeability of the medium." The text then continues to give the formula in line 6, but uses the wrong symbols ( $\epsilon_0$  instead of the correct  $\epsilon$ , and  $\mu_0$  instead of the correct  $\mu$ ). Wrong symbols are again used in line 7. However, line 8 begins: "The magnetic permeability ( $\mu$ ) through in-vivo tissue". This designation is correct, because it uses the correct symbol for permeability in a medium other than a vacuum, and supports the applicant's original intention to use the specific and correct Greek letter symbols for these characteristics in a medium, as opposed to in a vacuum. It is hoped that these locations in the provisional application and original specification provide sufficient evidence to support this reasoning.

Pages from the CRC Handbook of Chemistry and Physics serve to support the definitions of these symbols, and are included with this reply (1995 is the edition from which these pages are copied). Page 1-1 at the top and bottom sections (the all-important fundamental physical constants) both use the subscript zero with the  $\epsilon$  and  $\mu$  symbols, to indicate permittivity and permeability of vacuum. On page 2-3 (last line),  $\epsilon$  is shown to mean "permittivity"; whereas at the top of page 2-4,  $\epsilon_0$  is defined as "permittivity of vacuum", which clearly places a restriction on that particular symbol meaning **only** permittivity in a vacuum. The 11<sup>th</sup> and 12<sup>th</sup> items on that same page show the corresponding symbols for permeability, again indicating that  $\mu_0$  can only mean permeability in a vacuum. Finally, page 12-51 in this same reference book is titled

“Permittivity (Dielectric Constant) of Inorganic Solids”. It then states, “This table lists the permittivity  $\epsilon$ , frequently called the dielectric constant, of a number of inorganic solids.” We note for our purposes that the symbol  $\epsilon$  is used instead of  $\epsilon_0$ , because the text was addressing permittivity in materials or media **other** than a vacuum. There are other similar examples in this text; and every physics college text the applicant has checked, always define  $\epsilon_0$  as permittivity **in a vacuum**, and  $\mu_0$  as permeability **in a vacuum**.

For these reasons, the applicant must correct the appropriate locations in the specification and claims that she believes these to be typographical errors; in addition if these corrections were not made, it would render the text unscientific, not accurate, and untruthful.

Therefore, the specification currently submitted with this reply will maintain these corrections the applicant needs to make (and made in the previous specification), in hopes that the foregoing explanation and supporting material will sustain it.

Following are listed a few more additional wording changes maintained in the newly-submitted specification (also submitted in the previous specification).

At page 6 line 2 of the original specification, the word “measured” has been changed to “calculated”, because the length of genomic material is not measured per se in this process. This wording change is supported by the description of how to perform the calculation.

At several locations in the original specification, the “wavelength” has been changed to “length”: pg 7 line 2, pg 7 line 6, pg 9 line 3, pg 9 line 6, and pg 9 line 17. These changes are supported by use of the word “length” in the original specification at pg 13 lines 7-8 and 12-13. The applicant wishes to maintain consistency and clarity in the terminology. This consistency is likewise reflected in the amended claim language.

In the original specification, the step of frequency octave adjustment was described at page 7 lines 22-23 using two possible terms, “translated, or shifted”. The applicant feels the term “shifted” is the better of the two. To avoid confusion or unclarity, all instances of the term “translated” have been deleted from the newly-amended specification and claims, and the term “shifted” used at all appropriate locations.

There were places in the original specification that used the phrase “human audio range”. The applicant feels the inclusion of the word “human” is potentially redundant and possibly

misleading (different humans have different hearing ranges), and wishes to remove that word where it appears. Furthermore, in some instances in the original specification, the word “human” is not used (at page 16 lines 2, 4, and 6; and at page 19 lines 12, 14, 17, and 22). Therefore to maintain consistency and clarity, the term “human” (in associated with “audio”) has been removed from the newly-amended specification and claims.

**Further comments regarding newly-amended claims.**

**Claim 14.** The applicant has cancelled claim number 14, as it seemed to be a restatement of claim number 5.

Listed below are locations in the *original* specification which serve to support some of the new wording changes in the various claims. Certain wording rationale has already been discussed in the above comments for the specification.

**Preamble of claim 1.**

For the phrase “causes disease”: supported by text at pg. 20 line 4; and pg. 19 line 22 through pg. 20 line 1.

For the phrase “associated with”: supported by text at pg. 22 line 9.

For the phrase “disease-causing pathogen”, in particular the word “pathogen”: supported by text at pg. 20 line 4; and pg. 13 line 9.

For the phrase “implicated in”: supported by text at pg. 22 line 1 (oncogene implies association with cancer); pg. 22 line 15 (the outer surface protein of *Borrelia burgdorferi* implies association with that bacteria which implies lyme disease); pg. 23 lines 7-8 (the K-ras oncogene implies causation of the cancerous tumor).

**Last section of claim 1.**

For the phrase “debilitating or stimulating”: supported by text at pg.3 lines 13-20; pg. 10 lines 16-17; pg. 21 lines 3-5; pg. 23 lines 6-8; and the abstract.

For the phrase “favorable outcome”: supported by text at pg. 20 line 13 through pg. 21 line 2; and pg. 23 lines 3-14.

**Claim 2.**

For the phrase “known spacing value”: supported by text at pg. 9 lines 3 and 6, in the wording “known value”.

For the phrase “determining the number of base pairs or bases”: supported by text at pg. 8 line 23.

For the phrase “using the resulting value as a wavelength”. This phrase was first added to the original claims in the applicant’s June 2005 reply. It is supported by text at pg. 5 lines 10-13; pg. 12 lines 13-16; pg. 13 lines 7-8, 12; and pg. 20 line 6.

**Claim 8.**

For the phrase “debilitating or stimulating”: please see text locations above at “last section of claim 1”.

**CONCLUSION**

Applicant states that a full and complete response has been made herein to the past Office Actions mailed October 18 2005, and as such, asks that all amended claims submitted in this application be placed in condition for allowance. The applicant respectfully requests early consideration of the present application, entry of the amendments to claims and specification, and withdrawal of all rejections.

Respectfully submitted,

*Charlene A. Boehm*

Charlene A. Boehm

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Charlene Boehm  
320 Gilbert Rd.  
Columbus, NC 28722  
(828) 863-4317



## **SUMMARY OF INTERVIEW**

The applicant thanks examiner Moran for the telephone interview which took place on Dec. 8, 2005 at 9 a.m. There was generalized discussion of certain term definitions and purported typographical errors in the applicant's specification, and the requirements that would be necessary to clarify and correct those items. The examiner reviewed the need for submitting a form 1449 (SB08) to fulfill the information disclosure needed with the applicant's previous response dated June 9, 2005. The examiner also carefully explained what constitutes "new matter" when submitting new specification wording, and gave guidelines for correcting that problem associated with applicant's most recent specification submission (also June 9, 2005). Finally, there was extensive discussion of possible claim wording that would overcome the claim objections stated in the office's most recent response mailed Oct. 18, 2005.